

Median Time to Pain Medication for Patients with a Diagnosis of Sickle Cell Disease (SCD) with Vaso-Occlusive Episode (VOE) eCQM

Addendum Sensitivity Analysis Report

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Prepared for the American Society of Hematology by
Health Services Advisory Group, Inc.



Measure Information

Measure Title	Median Time to Pain Medication for Patients with a Diagnosis of Sickle Cell Disease (SCD) with Vaso-Occlusive Episode (VOE)	Measure Description	Median time (in minutes) from ED arrival to initial administration of pain medication for all patients, regardless of age, with a principal diagnosis of SCD with VOE
CMS Program Consideration	<ul style="list-style-type: none">• Hospital Outpatient Quality Reporting Program• Rural Emergency Hospital Quality Reporting Program	Measure Type	Process
Steward	American Society of Hematology (ASH)	Measure Developer	Health Services Advisory Group, Inc. (HSAG)

Background

This electronic Clinical Quality Measure (eCQM) was developed with input from a Technical Expert Panel (TEP) comprised of clinical experts in hematology and emergency medicine, as well as a patient representative.

A public comment solicitation was conducted after testing was completed to obtain feedback from those impacted by the measure. Several public comments suggested that the measure population should be expanded to include the pediatric population under 18 years of age. The project team was unable to perform testing of the pediatric population prior to the submission of the measure for CMS consideration in the Hospital Outpatient Quality Reporting (OQR) and Rural Emergency Hospital Quality Reporting (REHQR) Programs, since the original testing sample did not include pediatric patients. However, the measure population was expanded to include pediatric patients because it was supported by the clinical practice guidelines and the TEP agreed that the measure had face validity with the expanded measure population. Additionally, although approximately 24% of emergency department (ED) visits from 1999-2020 for patients with SCD involved patients from 0-19 years of age, and patients reported moderate to severe pain as the reason for the visit for approximately 77% of those visits¹, evidence from the literature suggests only minor differences in the median times to initial administration of analgesics between adults and pediatric patients. One multicenter study² conducted in the adult population showed a median time to administration of initial analgesic of 90 minutes and a single-site study³ observed a median time to administration of initial analgesic of 89 minutes for pediatric patients.

Following the submission of the measure to CMS during the 2024 Annual Call for Measures, the project team obtained pediatric data from a limited sample of the original testing sites. To evaluate the impact of the inclusion of the pediatric population on the measure, we examined the distribution of time to pain medication and measure scores for the three analyzed facilities. Results of these analyses are presented in Tables 1-3.

¹ Attell BK, Barrett PM, Pace BS, et al. Characteristics of Emergency Department Visits Made by Individuals With Sickle Cell Disease in the U.S., 1999-2020. *AJPM focus*. 2024;3(1):100158. doi:<https://doi.org/10.1016/j.focus.2023.100158>

² Tanabe P, Myers R, Zosel A, et al. Emergency department management of acute pain episodes in sickle cell disease. *Acad Emerg Med*. 2007;14(5):419-425. doi: 10.1197/j.aem.2006.11.033.

³ Lin SM, Strouse JJ, Whiteman LN, Anders J, Stewart RW. Improving quality of care for sickle cell patients in the pediatric emergency department. *Pediatr Emerg Care*. 2016;32(1):14-16. Doi: 10.1097/PEC.0000000000000369.

Results

The data in Table 1 provide the characteristics of the sample to evaluate the addition of the pediatric population. Three EHR vendors were represented, and all facilities were urban and academic.

Table 1. Characteristics of ED Sites

ED Site	State	EHR System Type	Urban/Rural Designation	Academic Designation	ED Trauma Level
1	DE	Cerner	Urban	Academic	1
2	NY	Epic	Urban	Academic	2
3	NY	Allscripts	Urban	Academic	2

The data in Table 2 show the proportion of pediatric and adult encounters and measure performance score by these populations across the three sites. Site 1 had no eligible pediatric encounters for patients with a diagnosis of SCD with VOE, thus there were no differences in median time from ED arrival to initial administration of pain medication between the total and adult-only populations. At Site 2, there were 22 pediatric encounters, representing 2% of the overall number of encounters. The pediatric population had a measure performance score of 92 minutes, which was 22 minutes greater than the adult-only population measure performance score of 70 minutes. However, the measure performance score for the total population, which included both the pediatric and adult populations, was 70 minutes, which was equal to the adult-only population. At Site 3, there were 119 pediatric encounters, representing 19% of the overall number of encounters. The pediatric population had a measure performance score of 44 minutes, which was almost an hour less than the adult-only population measure performance score of 101 minutes. The measure performance score for the total population, which included both the pediatric and adult populations, was 92 minutes, which was 9 minutes less than the adult-only population. When data from all sites were combined, the measure score for the total population (adult and pediatric) differed from the adult-only population by only 1 minute.

Table 2. Proportion of Encounters and Measure Performance Scores by Population

ED Site	Population	Number of Qualifying Encounters, N (%)	Median Time from ED Arrival to Initial Administration of Pain Medication	Difference Between Total and Adult Only Populations
1	Pediatric	0 (0%)	N/A	0 min
	Adult	265 (100%)	73 min	
	Total (Adult + Pediatric)	265	73 min	
2	Pediatric	22 (2%)	92 min	0 min
	Adult	1,420 (98%)	70 min	
	Total (Adult + Pediatric)	1,442	70 min	
3	Pediatric	119 (19%)	44 min	-9 min
	Adult	495 (81%)	101 min	
	Total (Adult + Pediatric)	614	92 min	
Overall	Pediatric	141 (6%)	51 min	-1 min
	Adult	2,180 (94%)	77 min	
	Total (Adult + Pediatric)	2,321	76 min	

The data in Table 3 display the distributions of time to pain medication from ED arrival (in minutes) for the original measure population (adults only) and the revised measure population (both adult and pediatric). Across the three sites, there were 2,180 qualifying encounters for adults with SCD and VOE, with an average time to pain medication of 92.5 minutes (SD 70.6 minutes) and a median (50th percentile) time of 77 minutes. The revised distribution, which added the 141 pediatric cases for a total of 2,321 qualifying encounters, was very similar to the original distribution, with an average time to pain medication of 90.9 minutes (SD 70.3 minutes) and a median (50th percentile) time of 76 minutes.

Table 2. Distribution of Time to Pain Medication Across Encounters for Original and Revised Measure for All Sites Combined

Population	Number of Qualifying Encounters, N	Time (in minutes) from ED Arrival to Initial Administration of Pain Medication								
		Mean	Standard Deviation	Min	Percentiles					Max
					10 th	25 th	50 th	75 th	90 th	
Original Measure (Adult-Only)	2,180	92.5	70.6	9	36	52	77	114	162	1,720
Revised Measure (Adult + Pediatric)	2,321	90.9	70.3	6	34	50	76	112	160	1,720

Conclusion

Including the pediatric population in the measure:

- Retains face validity per the TEP and is also supported by public comments and CMS.
- Aligns with the clinical guidelines which have no age restriction.
- Results in similar median times to pain medication compared to the original measure, consistent with findings from the literature, suggesting minimal impact to measure reliability.